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AUTHOR Pavonetti, Linda M.; Brimmer, Kathryn M.; Cipielewski, James F.

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ABSTRACT

Promoted by effective advertising and disseminated by word of mouth, many schools have adopted Accelerated Reader[R] as a supplementary reading program or as their primary reading program. Accelerated Reader[R]'s philosophy is that by using the system, students are motivated to read more and better books. A study investigated whether seventh grade students who were exposed to Accelerated Reader[R] during elementary school tend to do more reading of books than those without such exposure. Students (n=1,771) were recruited from middle schools in one exurban and two suburban school districts. The final analyses contained 1,536 students. A title recognition test has been shown to measure the same types of reading behaviors as a diary or log. Using such instruments, it is possible to determine whether there are differences in the amount of reading done by middle school students who have been exposed to Accelerated Reader[R] compared to those who have not. The study's results do not support the claim that the students who had used Accelerated Reader[R] read more than other students, with the exception of the suburban school district where Accelerated Reader[R] is being used in middle schools. In fact, in the other suburban school district students not exposed to Accelerated Reader[R] in elementary school were doing statistically significantly more reading than those students who were so exposed. There is much to be studied regarding Accelerated Reader[R]. Much remains to be determined as to the best way to increase motivation to read and to get students into books. (Includes 5 tables. Contains 18 references. Appended are title recognition test items.) (NKA)

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Linda M. Pavonetti, Kathryn M. Brimmer, James F. Cipielewski

Oakland University

Contact: Linda M. Pavonetti
Oakland University
Department of Reading & Language Arts
Rochester, MI 48309-4494
248-370-4683
pavonett@oakland.edu

Accelerated Reader®: What Are the Lasting Effects on the Reading Habits of Middle School Students Exposed to Accelerated Reader® in Elementary Grades?

Running head: ACCELERATED READER'S® EFFECTS ON READING HABITS

Presented at the 50th Annual Meeting of the National Reading Conference

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Accelerated Reader®: What Are the Lasting Effects on the Reading Habits of Middle School Students Exposed to Accelerated Reader® in Elementary Grades?

Promoted by effective advertising and disseminated by word of mouth, many schools have adopted Accelerated Reader® as a supplementary reading program or as their primary reading program. Promotional materials state that over 45,000 schools now use Accelerated Reader® (Swanson, n.d.). While there are several ERIC reports of research showing educational and motivational benefits for this program (e.g. Goodman, 1999; Paul, VanderZee, Rue, & Swanson, 1996), there are few peer-reviewed journal articles that document these effects. On the other hand, there are some reasons to be skeptical about the purported benefits of the program (Carter, 1996; Prince & Barron, 1998).

Accelerated Reader's philosophy is that by using the system, students are motivated to read more and better books. Consequently, because reading is a foundational skill, other academic domains will improve in conjunction with reading skills. Since successful readers appreciate reading and school more than struggling students, attendance rates will improve along with increases in overall achievement and self-esteem (Paul et al., 1996). "Accelerated Reader gets students excited about reading books. . . . Students who never read before suddenly become voracious readers after they experience success with Accelerated Reader. . . . With AR, you will…build lifelong readers and lifelong learners" (Swanson, 2000, p. 1).

The current study investigates whether seventh grade students who were exposed to Accelerated Reader® during elementary school tend to do more reading of books than those who did not have such exposure.

Background

Research has shown that students who read more, especially recreationally, do better on measures of reading comprehension and vocabulary

(Anderson, Wilson, & Fielding, 1988; Cipielewski & Stanovich, 1992; Cunningham & Stanovich, 1990, 1991). This research has provided evidence that the act of reading itself improves reading performance. Therefore, it is important that teachers develop in their students a reading habit that will endure and help to produce lifelong readers. Accelerated Reader® promises to help motivate these students (Swanson, 2000).

Accelerated Reader

According to promotional material, Accelerated Reader® has been in existence since 1986 and currently is used in 45,000 schools. It is heralded as "the world's most popular reading management software" (Amazing Things Happen at Schools That Use Accelerated Reader, n.d). Accelerated Reader® and ancillary materials include computerized reading diagnostic tests and 27,000 literal-level quizzes; computer-based record-keeping systems for both students and teachers; and STAR® Reading Program, a computerized, multiple choice, literacy skills objectives testing system.

Books that are included in the Accelerated Reader® Program are assigned two numbers: reading level and points. Previous to 1994, these reading levels were based on the Fry Readability Index then, after January 1994, on the Flesch-Kincaid reading index (Paul et al., 1996). Books are designated a point value, based on length and reading level, according to the following Accelerated Reader® formula:

$$AR\ Points = (10 + Reading\ Level) \times \frac{(Words\ In\ Book)}{100{,}000}$$

(Paul et al., 1996, p. 3).

For example, *Dear Mr. Henshaw* (Cleary, 1983), a Newbery Award winning book, is classified as a 4.0 reading level and consequently assigned 3.0 points.

Students self-select their books and complete computerized objective tests of 5, 10 or 20 questions when finished. The number of test questions is based on the book's length, reading level, and complexity, with most quizzes

having 10 questions (How Accelerated Reader® quizzes are designed, 1998). A student's final score is the percentage test score times the book's point value; for example, 80% (test score) x 3.0 points = 2.4 points for reading *Dear Mr. Henshaw* and answering 8/10 questions correctly. Students do not receive points if their test scores falls below 60% and they may take quizzes only once.

Concerns

The present study's authors have received anecdotal reports that cause concern. In one case a teacher reported that in her school students were not allowed to have discussions following sustained silent reading time for fear students would be able to learn enough to pass the Accelerated Reader® quizzes without having first read the book. In other instances, several librarians and a bookstore owner told us that parents were only selecting books that appeared on their respective schools' book list. Books not in the school's Accelerated Reader® program were not selected for recreational reading. There are also anecdotal reports of students taking tests repeatedly and then sharing the answers with other students. This appears more prevalent where grades are tied to the AR point totals. While there are certainly books of high caliber on the Accelerated Reader® lists, many kinds of books may not represented, especially the newest releases and books of poetry or informational books (Carter, 1996).

Measuring Relative Reading Amounts

Previous studies have shown that using an instrument with actual book titles interspersed with foils can determine relative levels of recreational book reading done by upper elementary and middle school students (Allen, Cipielewski, & Stanovich, 1992; Cunningham & Stanovich, 1990, 1991). This instrument, a Title Recognition Test (TRT), has been shown to measure the same types of reading behaviors as a diary or log such as that used by

Anderson and his colleagues in their 1988 study (Allen et al., 1992). Using instruments of this type, it is possible to determine whether there are differences in the amount of reading done by middle school students who have been exposed to Accelerated Reader® compared to those who have not. While the evidence will not prove that Accelerated Reader® is the cause of these behaviors, it will provide supporting evidences.

Method

Subjects

The students were recruited from seventh grade classrooms in one exurban and two suburban school districts. There were 1771 seventh grade students altogether, distributed in ten different middle schools. These middle schools are in districts where some of the feeder elementary schools use Accelerated Reader® and some do not. One suburban district employed Accelerated Reader® in its middle schools; the other two did not. Data collection took place during October of the participants' seventh grade year. The Title Recognition Test surveys were administered by the experimenters and by doctoral students they had trained. All students having valid permission slips were administered the survey and included in the determination of reliability estimates. Only students whom the researchers could determine were in the district during their fifth grade year (the last year of elementary school) were included in the statistical analyses. This resulted in 1536 students being included in the final analyses (see Table 1).

Table 1
School districts and participants in each district.

District	Number of Middle Schools	Students Completing surveys	Students Included in Analyses
Exurban District 1	2	333	297
Suburban District 2 (not using AR in middle school)	4	608	502
Suburban District 3 (using AR in middle school)	4	830	737

Title Recognition Test

The Title Recognition Test (TRT) was designed as an analog of recognition measures that had previously been used to assess amount of exposure to print in adults (Stanovich & West, 1989) and children (Allen, Cipielewski, & Stanovich, 1992; Cipielewski & Stanovich, 1992; Stanovich & Cunningham, 1990). These measures employ a signal detection logic whereby subjects must recognize actual target items (real book titles) when they are embedded among foils (phrases that are not book titles). There are several advantages to this checklist-with-foils method. First, it is immune to the social desirability effects that contaminate responses to subjective self-estimates of socially valued activities such as reading (Furnham, 1986; Paulhus, 1984). Guessing is not an advantageous strategy because it is easily detected and corrected for by an examination of the number of foils checked. Further, the cognitive demands of the task are quite low. The TRT checklist procedures have been shown to track independent reading quite well as demonstrated by the high levels of construct validity demonstrated between the TRT and diary measures tracking out-of-school reading (Allen et al., 1992).

The version of the TRT employed in the present investigation was similar to the children's measure used in previous research on print exposure effects (Allen et al., 1992; Cipielewski & Stanovich, 1992; Cunningham &

Stanovich, 1990, 1991). The version used in this investigation consisted of a total of 41 items: 25 actual children's book titles and 16 foils for book names. The titles were selected from lists of books for teens and young adults compiled by the American Library Association (1998, 1999) and the National Education Association's Read Across America book list (Teachers Announce, 1999), by consulting book store owners and librarians, and by consulting teachers and reading education professionals knowledgeable about current trends in children's literature. The list of children's titles appearing on the TRT is presented in Appendix A, along with the percentage recognition for each item. The foil titles are listed at the bottom of Appendix A, but on the actual TRT forms they were randomly interspersed with the real titles. All foils were checked against Books in Print listings to ensure their validity as pseudo-titles. In selecting the 25 items to appear on the TRT, an attempt was made to choose titles that were more likely to be part of middle school readers' independent reading. While some books were part of classroom reading programs, the emphasis was on more of the types of books that young adults would choose to read on their own.

The instructions that were read to the subjects and that were printed on their response sheets were as follows: "Below you will see a list of book titles. Some of titles are the names of actual books and some are not. You are to read the names and put a check mark next to the names of those that you know are books. Do not guess, but only check those that you know are actual books. Remember, some of the titles are not those of popular books." On the response sheet that the subjects completed, this measure was labeled the Title Recognition Questionnaire and was referred to in this manner by the survey administrator. The TRT took approximately 5 minutes to administer. For each subject, the number of correct targets identified was recorded as well as the number of foils checked. The split-half (odd/even) reliability of the number of correct items checked (Spearman-Brown corrected) was .81.

Calculating Cronbach's alpha produced a reliability estimate of .79. These reliabilities are consistent with those found in earlier investigations. Scoring on the task was determined by taking the proportion of the correct items that were checked and subtracting the proportion of foils checked. This is the discrimination index from the two-high threshold model of recognition performance (Snodgrass & Corwin, 1988).

Results

The first analysis compared students in all three districts, dividing them into two groups, those who had Accelerated Reader® in elementary school and those who did not (see Table 2). A *t*-test comparing the two groups showed no significant difference between groups (mean difference = -0.008, df = 1534, *t*-value = -1.025, $p = .31$).

Table 2
Unpaired *t*-test for TRT score: All students.

Accelerated Reader®?	Count	Mean	Difference	Degrees of Freedom	*t*-value	*p*-value
Yes	836	.340				
No	700	.332	-.008	1534	-1.025	.31

In order to control differences in reading levels between the districts, a *z*-score was computed for each TRT score within each district. These standard scores *by district* were then entered into an omnibus analysis. As Table 3 indicates, a *t*-test on these scores using whether or not students had Accelerated Reader® in elementary school as the grouping variable yielded no significant difference between the two groups (mean difference = -0.01, df = 1534, *t*-value = -0.25, $p = .80$). Having had Accelerated Reader® in elementary school does not appear to make a difference on this measure of reading.

Table 3

Unpaired *t*-test for TRT *z* score: All students.

Accelerated Reader®?	Count	Mean	Difference	Degrees of Freedom	*t*-value	*p*-value
Yes	836	-.006				
No	700	.007	-.013	1534	-0.253	.80

A further analysis of the TRT scores was conducted *by district*. This analysis produced mixed results (see Table 4). The exurban district did not show a statistically significant difference between those who had and did not have Accelerated Reader® in elementary school, although the trend in the data showed more reading by those who had not had the program (mean difference = -0.02, df=295, *t*-value = -1.56, *p* = .12). In Suburban School District 2, which did not use Accelerated Reader® in the middle schools, the results were significant in favor of those elementary schools that did not use the program (mean difference = -0.056, df = 500, *t*-value = -3.86, *p* = .0001). Finally, in Suburban School District 3, which used Accelerated Reader® in all of the middle schools, the results favored the elementary schools that had used the program (mean difference = .037, df = 735, *t*-value = 3.43, *p* = .0006).

Table 4

Unpaired *t*-test for TRT *z* score.

School District	Accelerated Reader®?	Count	Mean	Difference	Degrees of Freedom	*t*-value	*p*-value
Exurban (1)	Yes	114	.251				
	No	183	.275	-.024	295	-1.558	.12
Suburban (2) (no middle school AR)	Yes	364	.331				
	No	138	.388	-.056	500	-3.859	.0001
Suburban (3) (with middle school AR)	Yes	358	.377				
	No	379	.340	.037	735	3.428	.0006

Other analyses were conducted at the individual middle school level but they are mixed and not conclusive. In several schools, especially those in

the suburban district using Accelerated Reader® in middle school, the numbers in the two group were very uneven.

Discussion

This study was conducted to investigate the claim that use of Accelerated Reader® would result in students who read more than those students who did not use the program. The results of this study do not support that claim with the exception of the suburban school district where Accelerated Reader® is being used in the middle schools. In fact, in the other suburban school district students not exposed to Accelerated Reader® in elementary school were doing statistically significantly more reading than those students who were so exposed. At best it seems that Accelerated Reader® in elementary school does not produce middle school students who read more. The question remains as to why this should be so.

In the case of the first two districts, Exurban School District 1 and Suburban School District 2, the middle schools did not use the Accelerated Reader® Program. However, Suburban School District 3's middle schools did use Accelerated Reader®. Comparing the TRT *z* scores of the first two districts who used Accelerated Reader® in elementary but not middle school reveals a significant difference in favor of those students who did not use Accelerated Reader® in elementary school (mean difference =-0.266, df = 797, t-value = -3.720, p = .0002).

Table 5

Unpaired t-test for TRT z score: Exurban School District 1 & Suburban School District 2.

Accelerated Reader®?	Count	Mean	Difference	Degrees of Freedom	t-value	p-value
Yes	478	-.107				
No	321	.159	-.266	797	-3.720	.0002

This seems to indicate that when the Accelerated Reader® Program is used in elementary school it does not result in middle school students who read more relative to those students who did not use it. In fact, the opposite is the case. Students who did not have Accelerated Reader® in elementary in these two districts are reading more relative to their Accelerated Reader® exposed peers.

As for the advantage that Accelerated Reader® readers have in the school district using Accelerated Reader® in the middle school, could it be the result of those students having an advantage in understanding how the program works? Other material seems to indicate that the effects of Accelerated Reader® increase with time (Paul et al., 1996). Perhaps this time advantage is related to being able to negotiate the program more efficiently.

This study certainly does not represent the final word on the merits of Accelerated Reader®. There is much to be studied regarding this program. In particular, it is important to look at the factors that have been so strongly linked to reading behaviors and reading achievement such as motivation, reading ability, and school and home environment. It seems to be particularly important to relate the studies of Baker and Wigfield (1999), Gambrell (1996), Guthrie, Wigfield, Metsala and Cox (1999), McKenna and Kear (1990), and Turner and Paris (1995), that examine motivational factors influencing how much reading students engage in. In particular, Turner and Paris' (1995) discussion on the role of classroom literacy tasks seems particularly relevant in this discussion. Their vignettes describing open versus closed tasks may inform how we consider Accelerated Reader®. In AR students are taking end-of-book tests that are composed of admittedly literal recall questions (How Accelerated Reader® quizzes are designed, 1998). There is only one specific correct answer to each question. These quizzes would be classified as "closed tasks" using Turner and Paris' definition (1995, p. 664). Turner and Paris go on to conclude that open-ended tasks are more

supportive of literacy growth. This is important to later literacy growth as well. "The motivational outcomes of literacy tasks influence how students interpret their roles in learning to read. Those interpretations can affect their desire to persist and to remain involved in literacy" (1995, p. 671). While they are speaking about first graders in their study, it is not difficult to extend their conclusions to upper grade students.

Guthrie and his colleagues (1999) help to explain the importance of motivation in reading development:

> In our view, one of the major contributions of motivation to text comprehension is that motivation increases reading amount, which then increases text comprehension. . . . [We] showed that different aspects of reading motivation (both intrinsic and extrinsic) predict the reading amount of children and adolescents. In addition, reading amount leads to increases in reading comprehension. (p. 250-251)

Much remains to be determined as to the best way to increase motivation to read and to get students into books. However, we must not be driven by promises of short-term gains. Forced by public opinion, principals, administrators, and teachers strive to achieve immediate results regardless of long-term consequence. All eyes are focused on year-by-year comparisons of nationally standardized or state administered tests. Few stop to consider the effects of such testing on students' ability to think creatively or with curiosity, to revel in new knowledge—for the pure joy of learning. What will these students be like in ten years? Will they be responsible employees who exhibit initiative? Will they be involved parents who read to their children at bedtime? Or will they be so "tested" that they will remove themselves from all contact with school, teachers, and even books? These questions as well as others regarding the effects of relative reading ability and achievement on reading motivation need to be investigated. This study addresses but one of many aspects that need to be explored.

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Children's Books

Cleary, B. (1983). Dear Mr. Henshaw. New York: Morrow.

Appendix A
Title Recognition Test Items

	Percentage Recognition
Targets:	
Ella Enchanted	41.2%
All Creatures Great and Small	17.1%
Beyond the Burning Time	4.7%
Holes	55.3%
Indian in the Cupboard	88.0%
To Kill a Mockingbird	49.3%
Redwall	27.0%
Witch Baby	3.2%
Island of the Blue Dolphins	74.9%
Owl in Love	1.9%
Call of the Wild	65.8%
Carrie	12.6%
Hatchet	84.6%
The Witches	53.9%
My Side of the Mountain	57.5%
The Subtle Knife	4.1%
Catherine Called Birdy	10.9%
The Outsiders	48.7%
The Sign of the Beaver	56.2%
The Boggart	12.6%
Hank the Cow Dog	7.8%
Frindle	14.8%
Chicken Soup for the Teenage Soul	89.5%
Wrinkle in Time	61.0%
Adrift: 76 Days Lost at Sea	10.7%
Foils:	
Sadie Goes to Hollywood	4.2%
Searching the Wilds	3.7%
The Legend of Sean O'Toole	4.6%
Never Lie to Your Teacher	5.1%
Football Freaks	7.4%
Let's Save the Pandas	6.6%
The Ghosts in Room 313	16.9%
Katie of Norway	3.0%
Chaos in the Cafeteria	3.7%
Grandpa Found an Alien	4.2%
The Exploits of Hillary and Her Friends	1.8%
Joshua Johnson	1.5%
BMX Champs	11.9%
Mystery of the Missing Masserati	4.0%
Melvin Meets the Moonlight Monsters	4.2%
The Superheroes Fan Club	2.8%